

REMARKS

Reconsideration of the outstanding Office Action is respectfully solicited.

As noted above, an IDS, entitled "UPDATE TO INFORMATION DISCLOSURE STATEMENT of July 1, 2004" is filed concurrently. Also attached hereto is a DECLARATION of Mr. Marston.

Claims 1-69 have been canceled. New claim 70 is based on claim 31 and the disclosures at page 6, line 1 (at least 5 wt%) and page 6, lines 20 to 26 (0.3 to 1 wt% of cross-linking monomer). New claim 71 is based on page 6, line 10. New claim 72 is based on page 6, lines 10 to 12. New claim 73 is based on page 6, lines 2 to 7. Previous claims 32 to 36 have been renumbered as new claims 74 to 78. New claim 79 is based on previous claim 36. New claims 80 to 87 are based on previous claims 38, 39, 42, 43, 44, 46, 47 and 48 respectively. New claim 88 is based on previous claim 31, previous claim 44, page 3, line 33 to page 4, line 2 (alkyl acrylate), page 7, lines 6 to 11 (3 to 15 wt% of particulate copolymer), page 6, line 28 to page 7, line 26 (definition of particulate copolymer) page 11, lines 23 to 25 (shear rate). New claims 89 to 92 are based on previous claims 49 to 52. New claim 93 is based on page 6, lines 10 to 12. New claim 94 is based on page 6, lines 2 to 7. New claim 95 is based on page 5, line 28. New claims 96 to 107 are based on previous claims 54 to 57, 59 to 61, and 63 to 68, respectively.

Claim 70 provides an improved process for forming a melt-processable thermoplastic composition which may be used to form articles which exhibit low gloss (page 1, paragraph 1, page 3, paragraph 2, page 14, final paragraph), a smooth surface (page 8, paragraph 2 and page 14, lines 24 to 26) and possess an acceptable impact resistance (page 15, paragraph 2), thereby permitting such articles to be used in construction. Unexpectedly, and evidenced by the enclosed Declaration, if a particular cross-linked particulate acrylic copolymer comprising at least 50 wt% methyl methacrylate, 5 to 20 wt% of a copolymerisable alkyl acrylate or alkyl methacrylate and 0.3 wt% to 1 wt% of a cross-linking monomer is mixed with a thermoplastic polymer under shear so that the particulate copolymer is broken down, then an article may be formed having a smooth surface, low gloss and desired impact resistance.

It should be noted that in order to provide a resultant composition having the desired characteristics, the acceptable ranges of the amount of alkyl acrylate or alkyl methacrylate comonomer and the amount of cross-linker in the particulate are extremely narrow.

The enclosed Declaration of Mr. Marston exemplifies variations in the impact toughness and surface gloss of a melt-processable composition due to (a) different amounts of comonomer in the particulate copolymer and; (b) different amounts of cross linking comonomer in the particulate copolymer.

Figure 1 exemplifies how the surface gloss of a thermoplastic composition increases by increasing the amount of acrylic comonomer in the particulate copolymer. As stated at page 14 of the present application the surface gloss measured at 75° observation angle is preferably less than 75°, this represents the upper acceptable limit indicated by the horizontal line in Figure 1. It is clear that for the range of comonomer in the particulate as claimed (i.e. 5 to 20 wt%), the resultant thermoplastic composition exhibits a surface gloss within the preferred boundaries. Note however that preferably the surface gloss is preferably less than 75 (for example less than 60) which corresponds to the preferred range of comonomer as claimed in new claim 73.

Figure 2 exemplifies how the impact resistance of the melt-processable thermoplastic composition increases with increasing amounts of copolymerisable comonomer in the particulate copolymer. As stated in the present application the minimum impact resistance is preferably not less than 7.5 inches (see page 15, paragraph 2) which equates to approximately 60 in-lb. As stated in the Declaration preferably the impact resistance is 85 in-lb as shown by the horizontal line In Figure 2 of the Declaration. Suitably, melt-processable compositions formed by the process as claimed in claim 70 by including a particulate having at least 5 wt% copolymerisable comonomer satisfy this requirement.

Figure 3 exemplifies how the surface gloss of a thermoplastic composition decreases by increasing the amount of cross-linking monomer in the thermoplastic composition. It is clear from Figure 3 that the particulate copolymer must include 0.3 wt% or more of the cross-linking monomer in order to produce a thermoplastic composition which exhibits the desired surface gloss.

Figure 4 exemplifies how the impact resistance of the melt-processable thermoplastic composition increases with decreasing amounts of cross-linking comonomer (EGDMA) present in the particulate copolymer. Essentially the maximum amount of EGDMA which may be present is 1.3% by wt, hence the upper limit has been set to 1 wt% in claim 1.

In summary, Figures 1 to 4 exemplify the requirement to balance both the amount of cross-linking monomer and acrylic comonomer present in the particulate, in order to achieve both the desired surface gloss and impact resistance of the resultant composition. The acceptable range of values for the amount of cross-linking comonomer and acrylic comonomer which may be present in the particulate copolymer represent extremely narrow ranges, namely: 0.3 wt% to 1 wt% or less of cross-linking comonomer; and, 5 to 20 wt% (claim 1), preferably 12 to 18 wt% (claim 73) of acrylic comonomer. It is the selection of such narrow ranges which provides the resultant thermoplastic composition with the desired low gloss and impact resistance.

Applicants respectfully traverse the rejections under 35 U.S.C. 102 and/or 103(a) over Griffith '434.

US 3,345,434 (Griffith) relates to a process for producing an article having a rough finish which diffuses light (column 1, lines 13 to 15 and column 1, line 54 to column 2, line 13). In particular, this is achieved by blending, for example at shear stresses of at least 10 psi (column 3, lines 7 to 12) a cross-linked thermoplastic polymer particulate with a non-crosslinked thermoplastic polymer (see column 2, lines 39 to 42). The general disclosure of Griffith provides a multitude of potential monomers which may be employed in the cross-linked thermoplastic polymer, of which alkyl (meth)acrylates are disclosed as one of a large number of possibilities (see column 3, line 22 to column 4, line 55). Optionally, such monomers may be used singly (i.e. to form homopolymers) or in combination to form copolymers (see column 3, lines 40 onwards). Thus, the general disclosure does not explicitly disclose a particulate copolymer comprising at least 50% by wt methyl methacrylate and 5 to 20% by wt of a copolymerisable alkyl acrylate or alkyl acrylate comonomer, as to arrive at such a copolymer it is necessary to select arbitrarily specific monomers in specked amounts from numerous lists. Moreover, the general disclosure of Griffith states the cross-linking comonomer is present in an amount of 0.5 to 15% by wt of the particulate comonomer. The amount of cross-linking

comonomer of the particulate in the process as claimed in claim 70 (0.3 to 1 wt%) represents a narrow selection of the broad range disclosed by Griffith.

With regard to Example 14, this discloses a cross-linked polymer which includes 25% by wt of an acrylic comonomer. This is outside the presently claimed range of 20% by wt. Thus claim 1 is novel over Griffith.

With respect to a rejection of claims under 35 U.S.C. 103(a) over Griffith '434, applicants submit that, it is most unlikely a skilled person would be motivated on reading Griffith to make the following number of selections:

- (1) To employ an acrylic particulate copolymer comprising methyl methacrylate and an alkyl (meth)acrylate comonomer by selecting such monomers from the extensive list of possible monomers as disclosed at column 3, line 22 to column 4, line 55; then to make the non-obvious selection
- (2) to employ an extremely narrow range of 5 to 20% by wt of the alkyl (meth)acrylate comonomer in the acrylic particulate copolymer; then to make the further non-obvious selection
- (3) to employ an extremely narrow range of 0.3 to 1 wt% of cross-linking monomer

in the expectation of producing a thermoplastic composition which exhibits low gloss and improved impact resistance, as Griffith provides no motivation whatsoever to do so. Griffith is completely silent that such a number of selections could, let alone would, provide a resultant thermoplastic composition that exhibits the desired low gloss and impact resistance as supported by the Examples in the attached Declaration.

Applicants respectfully traverse the rejection of the claims under 35 USC 102 and/or 103(a) over GB 2,057,466.

GB 2,057,466 relates to forming a delustered thermoplastic resin composition by blending a thermoplastic polymer with a cross-linked particulate polymer. The general disclosure of GB 2,057,466 teaches the skilled person that the amount of cross-linking monomer in the particulate may be present within a broad range i.e. 0.5 to 5 parts by weight. However,

preferably the cross-linking comonomer is present in an amount of 1.5 to 4 parts by weight, namely outside the narrow claimed range of the particulate copolymer as claimed in claim 70 (see page 2, lines 23 to 24). Suitably, as discussed in relation to Griffith above, the general disclosure of GB 2,057,466 provides a multitude of potential comonomers which may be employed in the particulate copolymer in extremely broad amounts (see page 1, line 62 to page 2, line 13). Such a general disclosure does not disclose a particulate copolymer which includes greater than 50% wt methyl acrylate and 5 to 20% of alkyl (meth)acrylate comonomer as to arrive at such a combination of comonomers and within the ranges claimed it is necessary to perform a number of selections from a multitude of options. Certain Examples of GB 2,057,466 disclose a cross-linked particulate copolymer which includes methyl methacrylate and an alkyl acrylate. In this respect, Examples 6 and 7 only include 20% by wt methyl methacrylate, Example 8 includes 50% by wt methyl methacrylate and 45% by wt butyl methacrylate, Examples 9 and 10 include 30% butyl acrylate, whereas Example 6 which includes 20% butyl acrylate and methyl methacrylate (see Table 4) also includes 2.4% by wt alkyl methacrylate cross-linker (refer to Example 1). Thus all of the particulates as disclosed in the specific examples include at least one component outside of the range as claimed. Thus Applicants submit new claim 1 is novel over GB 2,057,466.

Applicants also respectfully request withdrawal of the rejection of Claims under 35 USC 103(a) over GB 2,057,466 and note that their comments with respect of Griffith above apply *mutatis mutandis*. In addition, a preferred embodiment of GB 2,057,466 leads a skilled person away from selecting a narrow range of cross-linking comonomer i.e. 0.3 to 1 wt% as claimed in the expectation of improving impact resistance. Firstly, as mentioned above GB 2,057,466 states the preferred range of the amount of cross-linker is 1.5 to 4 wt% (see page 2, lines 23 to 24). Moreover, this is exemplified by the amount of cross-linker employed in the particulates of the specific examples (see Examples 1 to 5 for example).

Secondly, albeit in relation to a different particulate copolymer, GB 2,057,488 teaches a skilled person that the impact strength is increased by increasing the amount of cross-linking monomer in the particulate copolymer (see Experiments 1 to 3 in Table 5 - Izod Impact Strength). This is completely the opposite effect as exemplified by Figure 4 in the enclosed Declaration. Thus, we submit claim 1 is not obvious over GB 2,057,466.

Applicants respectfully traverse the rejections of claims over GB 1,197,957, under 35 USC 102 or 103.

GB 1,197,957 relates to producing articles having a pimpled (i.e. rough) matt finish (page 1, lines 29 to 34 and page 2, lines 64 to 66). This is achieved by mixing a polymer A with a polymer B where:

Polymer A is either:

- (1) a methyl methacrylate homo or copolymer having a viscosity of 0.4 to 0.55 (page 1, lines 40 to 44); or
- (2) a methyl methacrylate homo or copolymer having a viscosity of 0.8 to 1.2 (page 1, lines 44 to 50); and

Polymer B is either

- (1) a methyl methacrylate homo or copolymer having a viscosity of at least 1.6 (page 1, lines 50 to 56); or
- (2) a methyl methacrylate homo or copolymer which includes 0.2 to 5.0% by weight of a cross-linking monomer.

The general disclosure of GB 1,197,957 discloses a multitude of potential copolymerisable comonomers for polymers A and B at page 1, line 73 to page 2, line 2. Thus for similar reasons as discussed above in relation to Griffith and GB 2,057,466, the general disclosure of GB 1,197,957 does not disclose the particulate copolymer as claimed in claim 70 as to arrive at such a copolymer it is necessary to select arbitrarily specific monomers in specified amounts from various lists. With regard to the specific Examples 6 to 15, all of these include 3 parts of ethyl acrylate comonomer which is below the lower limit of 5 wt% as claimed in claim 70. Thus claim 70 is novel over GB 1,197,957.

Applicants respectfully traverse the rejection of claims under 35 USC 103 over GB 1,197,959.

With regard to inventive step, GB 1,197,957 aims to solve a completely different technical problem than the one solved by the invention of the present application, as GB 1,197,957 is directed to producing an article having a pimpled matt finish, rather than a smooth

surface of low gloss. Moreover, the same comments with regard to GB 2,057,466 and Griffith apply equally to GB 1,197,957; as GB 1,197,957 does not teach or suggest that a particulate including a narrow range i.e. 0.3 to 1 wt% cross linking comonomer In combination with 5 to 20 wt% comonomer could, let alone would, when mixed with a thermoplastic copolymer such that the particulate is broken down, produce a composition which exhibits the desired impact toughness and surface gloss. Thus, we submit new claim 70 involves an inventive step over GB 1,197,957.

Applicants respectfully traverse the rejections of claims under 35 U.S.C. 103 over Griffith '434, or GB2057466 or GB 11979957 in view of Polymer Melt Rheology Text. The U.S. PTO recognizes that none of Griffith '434 GB or GB2057466 or GB 11979957 describe the required elements of the claims presented herein. In applicants' view the reason applied by the PTO for combining Polymer Melt Rheology Text with the three primary references do not make up for the deficiencies of the descriptions of the primary references and thus do not provide a prima facie case of obviousness. The U.S. PTO relies on that reference and asserts that a typical extrusion would expose "the composition to a shear rate much higher than 100s⁻¹ at the die.[]"

Regarding the level of skill in the art, , it is most unlikely a skilled person would be motivated on reading the primary references or the secondary references to make the following number of selections:

- (1) To employ an acrylic particulate copolymer comprising methyl methacrylate and an alkyl (meth)acrylate comonomer by selecting such monomers from the extensive list of possible monomers as disclosed at column 3, line 22 to column 4, line 55; then to make the non-obvious selection
- (2) to employ an extremely narrow range of 5 to 20% by wt of the alkyl (meth)acrylate comonomer in the acrylic particulate copolymer; then to make the further non-obvious selection
- (3) to employ an extremely narrow range of 0.3 to 1 wt% of cross-linking monomer

in the expectation of producing a thermoplastic composition which exhibits low gloss and improved impact resistance, as none of the applied references provides any motivation

whatsoever to do so. The references are completely silent that such a number of selections could, let alone would, provide a resultant thermoplastic composition that exhibits the desired low gloss and impact resistance as supported by the Examples in the attached Declaration.

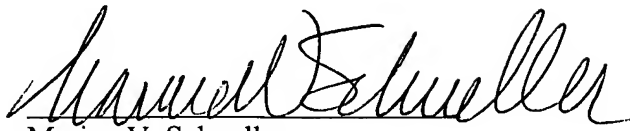
Applicants respectfully traverse the rejections of previously presented, now canceled Claims, under 35 U.S.C. 112. The claims presented herein seek to obviate any issue raised at page 2 of the Office Action.

Reconsideration and an early allowance are respectfully solicited.

Respectfully submitted,

Date:

July 9 2004



Marina V. Schneller

Registration No. 26,032

VENABLE

P.O. Box 34385

Washington, D.C. 20043-9998

Telephone: (202) 344-4000

Telefax: (202) 344-8300